

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No
PCT/EP2004/052059

International filing date (day/month/year)
06.09.2004

Priority date (day/month/year)
08.09.2003

International Patent Classification (IPC) or both national classification and IPC
G06T15/40

Applicant
POLITECNICO DI MILANO

1 This opinion contains indications relating to the following items:

- ☒ Box No. I. Basis of the opinion
- ☒ Box No. II. Priority
- ☐ Box No. III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV. Lack of unity of invention
- ☒ Box No. V. Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI. Certain documents cited
- ☐ Box No. VII. Certain defects in the international application
- ☐ Box No. VIII. Certain observations on the international application

2 **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220

3 For further details see notes to Form PCT/ISA/220

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/EP2004/052059

Box No. I Basis of the opinion

- 1 With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b))
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
- 3 ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
- 4 Additional comments:

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/EP2004/052059

Box No. II Priority

1. ☒ The following document has not been furnished:
- ☐ copy of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(a))
 - ☒ translation of the earlier application whose priority has been claimed (Rule 43bis 1 and 66 7(b))
- Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64 1) Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date
3. ☐ It has not been possible to consider the validity of the priority claim because a copy of the priority document was not available to the ISA at the time that the search was conducted (Rule 17.1) This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date
4. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	2-5,7
	No: Claims	1,6,8,9
Inventive step (IS)	Yes: Claims	4,5,7
	No: Claims	1-3,6,8,9
Industrial applicability (IA)	Yes: Claims	1-9
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rules 43bis 1 and 70.10)
and /or
2. Non-written disclosures (Rules 43bis 1 and 70 9)
see form 210

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/EP2004/052059

1 The following documents are referred to in this communication:

D1 : BITTNER J ET AL: "Exact regional visibility using line space partitioning" COMPUTERS AND GRAPHICS, PERGAMON PRESS LTD. OXFORD, GB, vol. 27, no. 4, August 2003 (2003-08), pages 569-580, XP004441307 ISSN: 0097-8493

D2 : VLADLEN KOLTUN, YIORGOS CHRYSANTHOU, DANIEL COHEN-OR:
"Hardware-Accelerated from-Region Visibility Using a Dual Ray Space" PROCEEDINGS OF THE 12TH EUROGRAPHICS WORKSHOP ON RENDERING TECHNIQUES, [Online] 25 June 2001 (2001-06-25), pages 205-216, XP002317043 LONDON, UK ISBN: 3-211-83709-4 Retrieved from the Internet: URL: http://www.cs.ucy.ac.cy/~yorgos/publications/ray_space01.pdf [retrieved on 2005-02-10]

D3 : AUGUSTO SARTI AND STEFANO TUBARO: "Efficient geometry-based sound reverberation" PROC. OF EUSIPCO 2002, XI EUROPEAN SIGNAL PROCESSING CONFERENCE, 3 September 2002 (2002-09-03), - 6 September 2002 (2002-09-06) XP009043689 TOULOUSE, FRANCE

2 INDEPENDENT CLAIM 1

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

Document **D1** discloses (the references in parentheses applying to this document):

Method for determining the region of visibility between at least a first reflector and a second reflector comprising the following phases:

representing said first and second reflector in a system of coordinates (x,y,z) (*implicit feature*);

said method is characterised in that it comprises the further phases of:

carrying out an affine transformation of said system of coordinates (x, y, z) (*p. 571, sec. 4.1*);

determining the region of visibility of said second reflector in relation to said first reflector as the set of the parameters of the straight lines that link a generic point of said first reflector with a generic point of said second reflector (*fig. 6*).

3 INDEPENDENT CLAIM 6

3.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 6 is not new in the sense of Article 33(2) PCT, the reasons being as follows:

Claim 6 relates to a method for constructing a beam tree by means of the visibility

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technique proposed in (non-novel) claim 1. However, such a combination is already suggested by document **D1**, see abstract, l. 4 and fig. 8 (a)-(c). Consequently, claim 6 lacks novelty over **D1**.

4 DEPENDENT CLAIMS 2, 3

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 2 and 3 does not involve an inventive step in the sense of Article 33(3) PCT, the reasons being as follows:

The claims relate to a coordinate transformation which simplifies the notation of the mathematics underlying the method. However, this is just a slight constructional change in the method of claim 1 which comes within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen. Consequently, the subject-matter of claims 2 and 3 lacks an inventive step.

5 CLAIMS 4, 5, 7

The combination of the features of dependent claims 4, 5, 7 are neither known from, nor rendered obvious by, the available prior art.

6 INDEPENDENT CLAIMS 8 AND 9

The same reasoning as for claims 1-3 applies, mutatis mutandis, to the subject-matter of the corresponding independent claims 8 and 9, which therefore are also considered not new/inventive.

7 Final remarks.

Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents **D1-D3** and is not mentioned in the description, nor are these documents identified therein.

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